CLAIMS

What is claimed is:

1. A non-linear dispersive pulse generator for producing pulsed radio frequency electrical signals, including a non-linear dispersive electrical circuit incorporating at least one non-linear element made of a material sensitive to low power signals, and a means of producing a variable power control signal and applying the control signal to the at least one non-linear element to modify the extent of the non-linearity of the element and thereby vary the output frequency of the radio frequency electrical signal generated.

2. A generator according to claim 1, wherein the non-linear dispersive electrical circuit includes a plurality of non-linear elements in the form of inductors interconnected in series, a first array of coupling capacitors each linking the input side of one inductor to the output side of the next inductor in line for dispersive purposes, and a second array of capacitors arranged in parallel to one another such that each capacitor of the second array connects the input side of a different inductor to a common electrical line.

3. A generator according to claim 2, wherein the or each non-linear element material is a ferromagnetic material sensitive to a magnetic field and wherein the control signal producing means is operable to produce a relatively small variable electric current which gives rise to a variable low value magnetic field which is applied to the ferromagnetic material to adjust the initial state of the non-linear element and alter the behaviour of the non-linear element during modulation of a high power radio frequency signal to change the frequency of the radio frequency signal outputted from the generator.

4. A generator according to claim 3, wherein the control signal producing means includes a source of low power direct current which is applied to the input side of the non-linear dispersive electrical circuit with a high voltage input and which is returned to the source from the output side of the non-linear dispersive electrical circuit at the radio frequency signal output, and a computer control for varying the value of the low power direct current to vary the frequency of the radio frequency output signal.

5. A generator according to claim 1, wherein the or each non-linear element material is ferroelectric material sensitive to an electric field and wherein the control signal producing means is operable to produce a variable low value electric field which is applied to the ferroelectric material to adjust the initial state of the non-linear element and alter the behaviour of the non-linear element during modulation of a high power radio frequency signal to change the frequency of the radio frequency signal outputted from the generator.